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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,626	11/29/2001	Hiroyuki Watanabe	111242	2316

25944 7590 12/15/2004

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EXAMINER

MARSCHER, ARDIN H

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/995,626

**Applicant(s)**

WATANABE ET AL.

**Examiner**

Ardin Marschel

**Art Unit**

1631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 and 18-27 is/are pending in the application.
- 4a) Of the above claim(s) 8-13 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,4-7,14-16 and 18-21 is/are allowed.
- 6) ☒ Claim(s) 3 and 22-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-16 and 18-27 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ( <u>1 sheet</u> ). | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Applicants' arguments, filed 9/14/04, have been fully considered and they are deemed to be persuasive to overcome previous rejections of record. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

Unfortunately, however, upon reconsideration, the following rejections and/or objections are newly applied. They constitute the complete set presently being applied to the instant application.

Due to the newly applied rejections, summarized below, the finality of the Office action, mailed 6/14/04, is hereby withdrawn. The amendment, filed 9/14/04, has been entered.

### **VAGUENESS AND INDEFINITENESS**

Claims 3 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the last 2 lines of claims 3 and 23 the phrase "an electric current of 1 to 20 V" is internally conflicting. The symbol "V" apparently indicates voltage. A current is not a voltage. Thus referring to a current as a voltage range conflicts as to what is meant. Clarification via clearer claim wording is requested.

Abbreviations in claims generally lead to confusing interpretations. In claims 3 and 23 the "V" abbreviation is confusing as to what is meant thereby, especially given the above paragraph. Clarification via citing a complete name with the abbreviation or replacing the abbreviation with its full name is requested.

### **PRIOR ART**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 22-27 are rejected under 35 U.S.C. 102(e)(2) as being clearly anticipated by Kelley et al. (Patent Application Publication 2002/0172963).

The disclosure of Kelley et al. that is being relied on for the basis of this rejection is based on a provisional application number 60/260,758) which predates the filing date of the instant application.

The abstract of Kelley et al. summarizes the invention as directed to carbon nanotubes to which are attached biological molecules which are capable of electrical conductivity in response to chemical changes occurring as a result of their interaction with target species. This is also the general subject matter as instantly claimed. Carbon nanotubes with electrically connected double-stranded DNA molecules (a well known type of polymer) is described in paragraph [0010]. DNA/nanotube electrical conduction practice is also disclosed in paragraphs [0011] and [0012] which also describe electrical conductivity as being measured for uses thereof. The nanotubes are particularly referred to as nanoelectrodes (a type of electrode as instantly claimed) in paragraph [0015], last 6 lines. Paragraphs [0041] - [0064] describe in further detail the

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assembly of such nanotube/DNA structures, and include the polar DNA end group attachments as required in instant claims 25-27 specifically in paragraph [0060] - [0061]. Species of voltages in the 1-20 V range as in instant claim 23 is cited in the reference in paragraph [0082] utilized for detection purposes. The above disclosure of producing nanotube electrodes with a DNA polymer contacted thereto thus making an electrically conductive sensor anticipates instant claims 22-27.

### **CITATION OF INTEREST**

Bureau et al. (Patent Application Publication 2004/0081900) is cited on the enclosed PTO Form 892 due to describing organic polymer grafting onto carbon nanotubes in the combination of paragraphs [0043] and [0181] - [0184].

Claims 1, 2, 4-7, 14-16, and 18-21 are allowable.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (703) 872-9306.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., whose telephone number is (571) 272-0718. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (571) 272-0722.

Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instrument Examiner, Tina Plunkett, whose telephone number is (571) 272-0549.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 7, 2004

*Ardin H. Marschel* 12/7/04  
ARDIN H. MARSCHEL  
PRIMARY EXAMINER